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IS 6213-5 (1971): Methods of test for pulp, Part 5:
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[CHD 15: Paper and its products]



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Indian Standard

METHODS OF TEST FOR PULP

**PART V SOLUBILITY OF PULP IN ONE PERCENT
CAUSTIC SODA SOLUTION**

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METHODS OF TEST FOR PULP

PART V SOLUBILITY OF PULP IN ONE PERCENT CAUSTIC SODA SOLUTION

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METHODS OF TEST FOR PULP

PART V SOLUBILITY OF PULP IN ONE PERCENT CAUSTIC SODA SOLUTION

0. FOREWORD

0.1 This Indian Standard (Part V) was adopted by the Indian Standards Institution on 26 June 1971, after the draft finalized by the Paper Sectional Committee had been approved by the Chemical Division Council.

0.2 For obtaining good quality of paper, it is essential that the pulp which goes into the manufacture of paper is properly cooked and bleached. Formulation of this standard had been taken up in order to guide the people working in pulp and paper mills for the methods to be adopted for pulp analysis.

0.3 The determination of the solubility of pulp in caustic soda solution enables the assessment of degradation of pulps. Pulps which are relatively not unduly degraded during processing are relatively insoluble in dilute alkali solution. Degradation of cellulose is caused by drastic treatment during cooking or bleaching and results in loss of strength properties and opacity of the paper sheet made from the degraded pulp. This test, therefore, provides a valuable check during digestion and bleaching of pulp.

0.4 In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard (Part V) describes the procedure for determination of solubility of pulp in one percent caustic soda solution.

2. QUALITY OF REAGENTS

2.1 Unless otherwise specified, pure chemicals and distilled water (see IS : 1070-1960†), freshly boiled and cooled, shall be employed in the tests.

*Rules for rounding off numerical values (*revised*).

†Specification for water, distilled quality (*revised*).

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

3. REAGENTS

3.1 Caustic Soda Solution — Dissolve 10 g of solid caustic soda in distilled water. Titrate suitable volume of the solution first using phenolphthalein as an indicator and then methyl orange with standard hydrochloric acid. The difference between the two readings gives the amount of acid required by half the amount of sodium carbonate present in the caustic soda. Thus calculate the caustic soda concentration in the solution and adjust the volume of solution so that one percent caustic soda concentration is obtained.

3.2 Acetic Acid Solution

4. PROCEDURE

4.1 Take a clean representative sample of the pulp. Weigh out a portion of it for moisture determination. Weigh sample equivalent to 2 g of dry pulp accurately to 0.1 mg. Put the same in a 200-ml beaker with round edges. Pipette out of 100 ml of one percent caustic soda solution in the beaker. Stir the contents till the pulp sample is completely disintegrated and cover the beaker with a watch glass. Keep the beaker in a water-bath having boiling water. The height of the water in the bath should be maintained at a level above that of the liquid in the beaker. Let it stand exactly for one hour keeping the contents stirred frequently at regular intervals. Filter the contents by suction on a tared crucible. Wash the residue on the crucible with hot distilled water. Neutralize the residual caustic soda, if any, by washing with 50 ml of 10 percent acetic acid solution and finally wash thoroughly with hot distilled water. Dry the contents in the crucible in an air-oven at $103 \pm 2^\circ\text{C}$, cool, the crucible in a desiccator and weigh quickly the contents in a stoppered weighing bottle.

5. CALCULATION

5.1 Carry out two determinations and calculate as follows:

$$\text{Solubility in one percent caustic soda solution} = \frac{X - T}{X} \times 100$$

where

X = initial weight of pulp in g, calculated on oven-dry basis; and

T = weight of pulp in g, calculated on oven-dry basis after extraction.

6. REPORT

6.1 Report the result as a mean of the two determinations to two decimal places. The results should not vary by more than 5 percent from the mean result.

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